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Experiment to develop academic potential of outstanding high school juniors. Students participated in three activities: Mathematics, English, and semiweekly seminar in areas of students' choice.

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THE SUMMER INSTITUTE FOR HIGH SCHOOL HONORS STUDENTS AT THE UNIVERSITY OF SOUTH DAKOTA, JUNE 9 - JULY 18, 1958

Early in 1958 a group of South Dakota high school superintendents suggested to representatives of the State University that there be some kind of summer program for developing the academic potential of outstanding high school students. The University's College of Arts and Sciences Honors Committee responded by inaugurating the six-weeks Summer Institute for High School Honors Students. Eligible for the Institute were high school juniors whose scores on the California Test for Mental Maturity or the Otis Mental Ability Test placed them near or above the 90th percentile and who were recommended by their superintendents and teachers. Seniors were not invited because it was felt that they should begin their freshman college work if they were interested in spending a good part of the summer on a university campus. No formal credit was given for participation in the Institute.

Thirteen boys and five girls met the various qualifications including an unfortunately highly selective one--the ability and willingness to pay the $123 fee for tuition and for room and board in the University's dormitories. As it turned out, the number of students was ideal for intensive, individualized class work and for seminar discussions.

Students participated in three academic activities: a mathematics class, an English class, and a semi-weekly seminar in areas of the students' choice. There were also supervised visits to the University's laboratories, museum, observatory, television studio, and the like.

The mathematics class was taught by a professor of mathematics, Wayne Gutzman, and the English class by a professor of English, Sherwood Cummings. Each class met for a period of about ninety minutes (the bells for summer school classes were ignored); mathematics at eight a.m. and English at ten. Often impromptu discussions and blackboard experiments followed each class so that the students worked at high pitch from eight until noon.

Work in the two courses was designed to explore basic concepts and develop essential skills and not to duplicate or supplant regular high school or freshman

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college courses. In the mathematics class Dr. Gutzman used Introduction to Finite Mathematics by Kemeny, Snell, and Thompson (Prentice - Hall), but he took excursions outside the text in the direction of student interests. Explored were number systems, sets and relations between sets, mathematical induction, continuity and limits, basic concepts of differential and integral calculus, numerical analysis including the use of desk calculators, statistical decisions, and probability theory.

The students travelled eagerly through the new territory. After a class analysis of the decimal system one student presented a paper demonstrating that a system based on eights would be mathematically more efficient. Others translated compound statements like, "If Jim is stupid but Joe fails to get the prize, then Joe is not smart," into symbolic forms and then made truth tables from the forms. Work with the slide rule led to the solution of algebraic equations by Graeffe's method and to the construction of nomograms for solving the Pythagorean theorem and other formalas of the type $f_1 \cdot f_2 = f_3$. Probability theory was illustrated by problems like this one: If from a deck of cards containing only the four jacks and the four queens two cards are drawn, what is the probability that both cards are jacks, given that one is a red jack? Discussion of the concept of a function and limit of a function led easily into problems in differential and integral calculus, an area that Dr. Gutzman had thought would be beyond the reach of the students.

In the English class there were three major activities. On Mondays students brought themes that they had written on some subject discussed in either class or in the seminars. The themes were thrown on a screen by an opaque projector so that students and instructor could criticize the writing. Later each paper was read and marked by the instructor and returned to the students whose job it was to correct errors with the aid of Walsh and Walsh's Plain English Handbook (McCormick-Mathers), chosen for its adequacy combined with the low cost of forty-eight cents a copy. Student writing was apprently much improved by the end of six weeks. On the first day of the Institute students took Educational Testing Service tests in "Effectiveness of Expression" and "Comprehension and Appreciation of Literature,"

and on the last day they took different forms of the same tests. In effectiveness of expression the class rose from an average percentile score of 70 to a score of 82.

If the instructor took pride in the measured improvement of the students' writing ability he was humbled by the meager rise in appreciation of literature scores--from 85 to 85 5. Students were assigned Huckleberry Finn, Othello, novels from Six Great Modern Short Novels (Dell) and poetry from The Pocketbook of Verse; Wednesdays and Fridays were set aside for discussion of the literature. Perhaps the instructor made a mistake in encouraging the skeptical attitude toward literature (but he doesn't think so). He was determined not to make the students enjoy belles-lettres but to help them understand content and form until some of the richness of good reading crept up on the students, so to speak. Some work they did like: Huckleberry Finn, Noon Wine, the poems of Frost and Lindsay; but Shakespeare's sonnets on mortality, for example, failed to ignite because, I suppose, sixteen year olds haven't yet regarded themselves as mortal. Some consolation (and a good deal of credit to the high schools) can be derived from the fact that intitial scores on the test were high.

The reading-efficiency exercises given on Tuesdays and Thursdays were, on the other hand, apparently highly successful. For the first twenty minutes Society of Visual Education filmstrips were used in a projector equipped with a tachistoscope. In the early exercises three and four letter words were thrown on a screen for one-hundredth of a second; in later exercises word length was increased and finally phrases and whole sentences were projected. Students had trouble reading only the longer sentences at one-hundredth of a second, indicating their acquisition of a wide "eye-span". After the tachistoscope exercise, students worked in Miller's Increasing Reading Efficiency (Holt) which presents a series of graded exercises in reading. At the end of each exercise students marked their time and comprehension scores on graphs. Almost every student doubled his reading efficiency during the six weeks and several more than tripled it.

The semi-weekly seminars or "arguments," as the students liked to call them, were exuberant affairs. In their choice of topics the students showed what

intrigued them most: astronomy, evolution, psychology, nuclear physics, ethics, religion, current events, and careers. Students read appropriate works in the Honors Seminar Library and were further kept on course (they liked to talk freely) by the presence of a visiting professor who was an expert in the discussed topic.

The teachers, the students, and all concerned with the Institute agreed that it was a resounding success. In the opinion of their teachers the students made remarkable strides toward intellectual maturity. Their thinking became at once more tolerant and more disciplined. In the opinion of the students, as expressed in their jointly written evaluation report, the Institute should admit seniors next summer so that they might return. The glaring limitation of the project lay in the small number of students served, about two per cent of the top ten per cent of the juniors in the area. The University is presently exploring the possibility of a grant for extending the service of the Institute to more students.

Sherwood Cummings